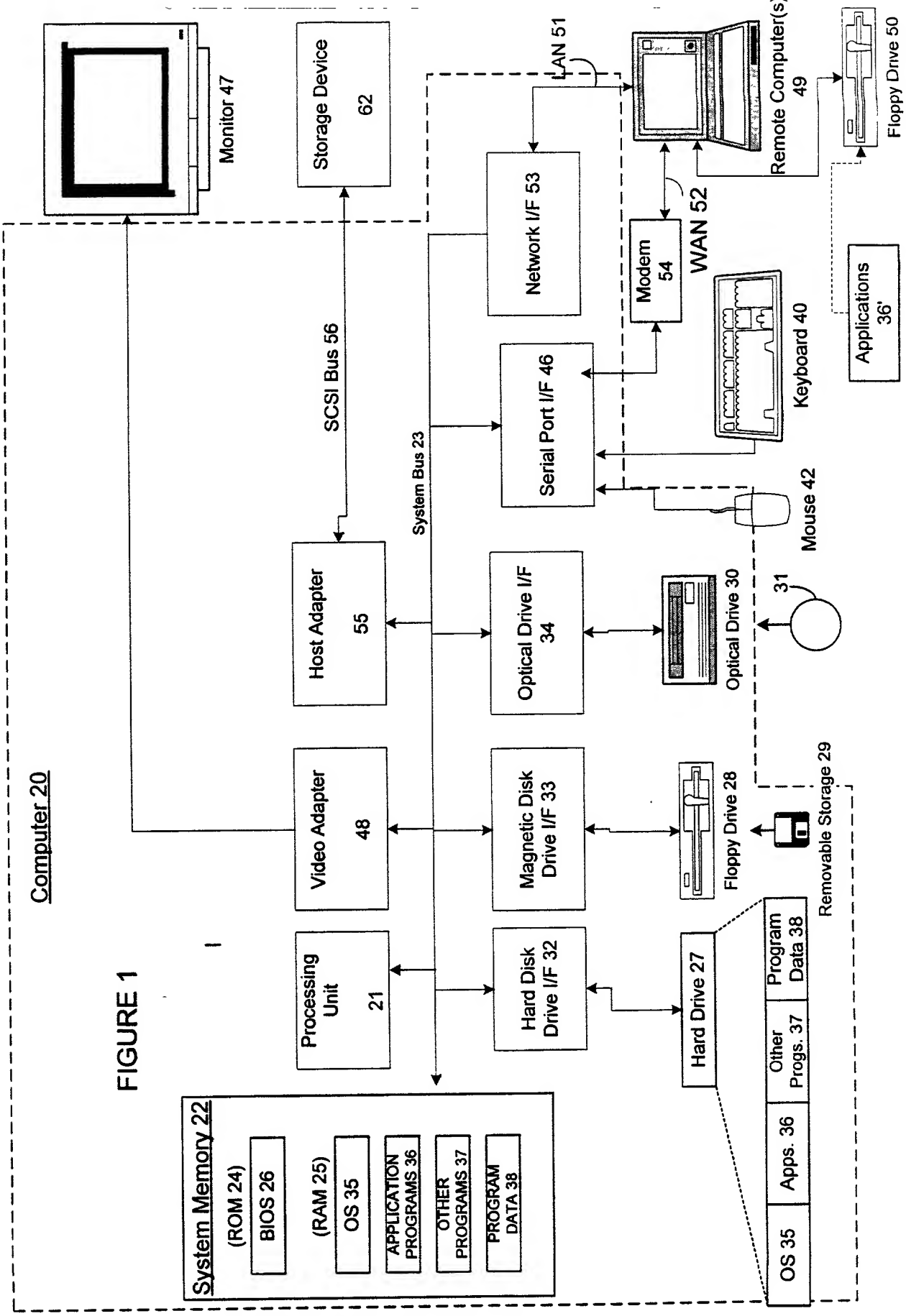
Computer 20
Monitor 47
Storage Device 62
LAN 51
Remote Computer(s) 49
Floppy Drive 50
Network I/F 53
Modem 54
WAN 52
Applications 36'
SCSI Bus 56
System Bus 23
Serial Port I/F 46
Keyboard 40
Mouse 42
Host Adapter 55
Optical Drive I/F 34
Optical Drive 30
31
Video Adapter 48
Magnetic Disk Drive I/F 33
Floppy Drive 28
Removable Storage 29
Processing Unit 21
Hard Disk Drive I/F 32
Hard Drive 27
Program Data 38
Other Progs. 37
Apps. 36
OS 35
System Memory 22
(ROM 24)
BIOS 26
(RAM 25)
OS 35
APPLICATION PROGRAMS 36
OTHER PROGRAMS 37
PROGRAM DATA 38

FIGURE 1

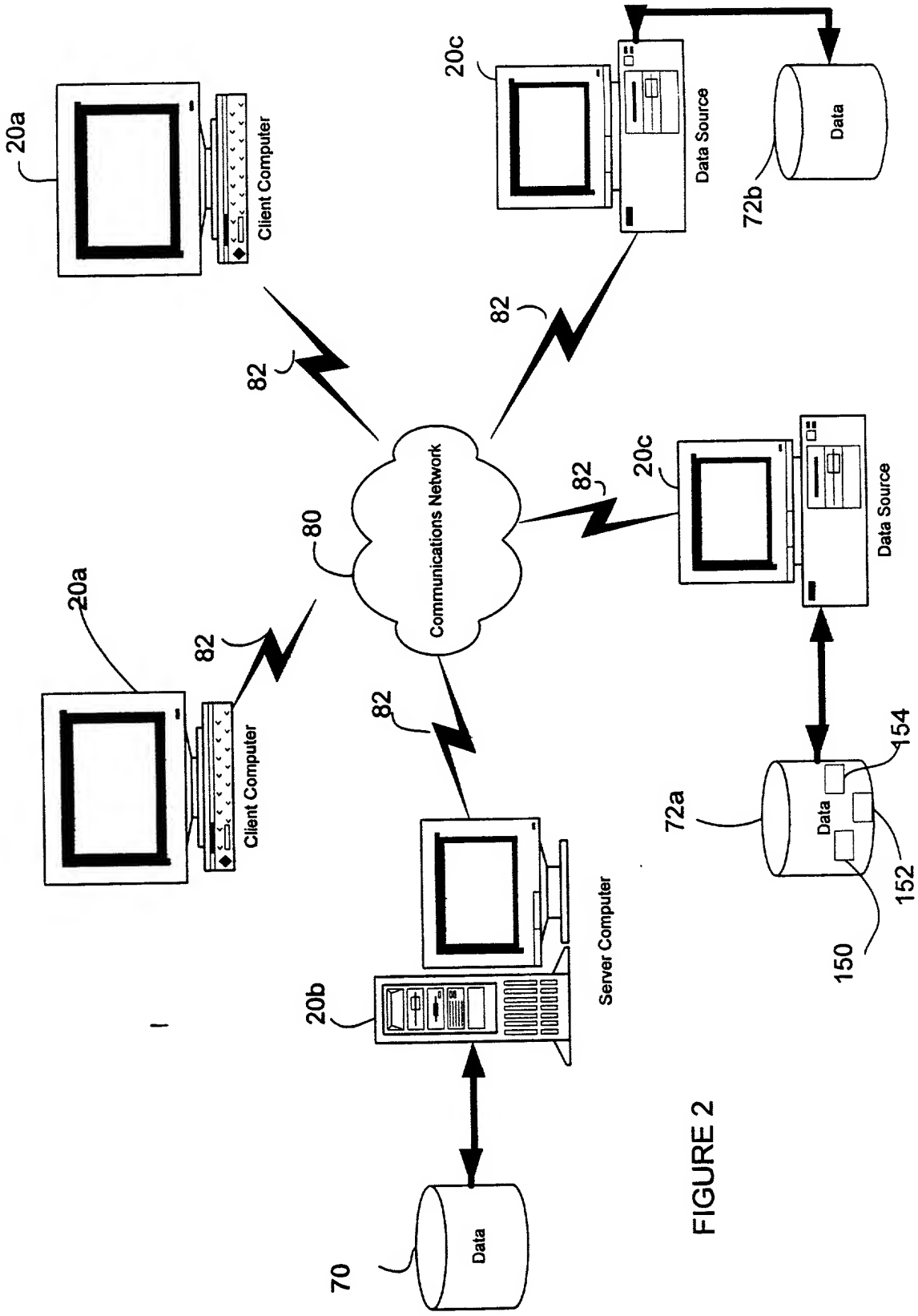
20a
Client Computer
20c
Data Source
Data
72b
82
82
Communications Network
80
82
20c
Data Source
20a
82
Client Computer
82
72a
Data
154
152
150
20b
Server Computer
70
Data

FIGURE 2

T09227F 908tE00T

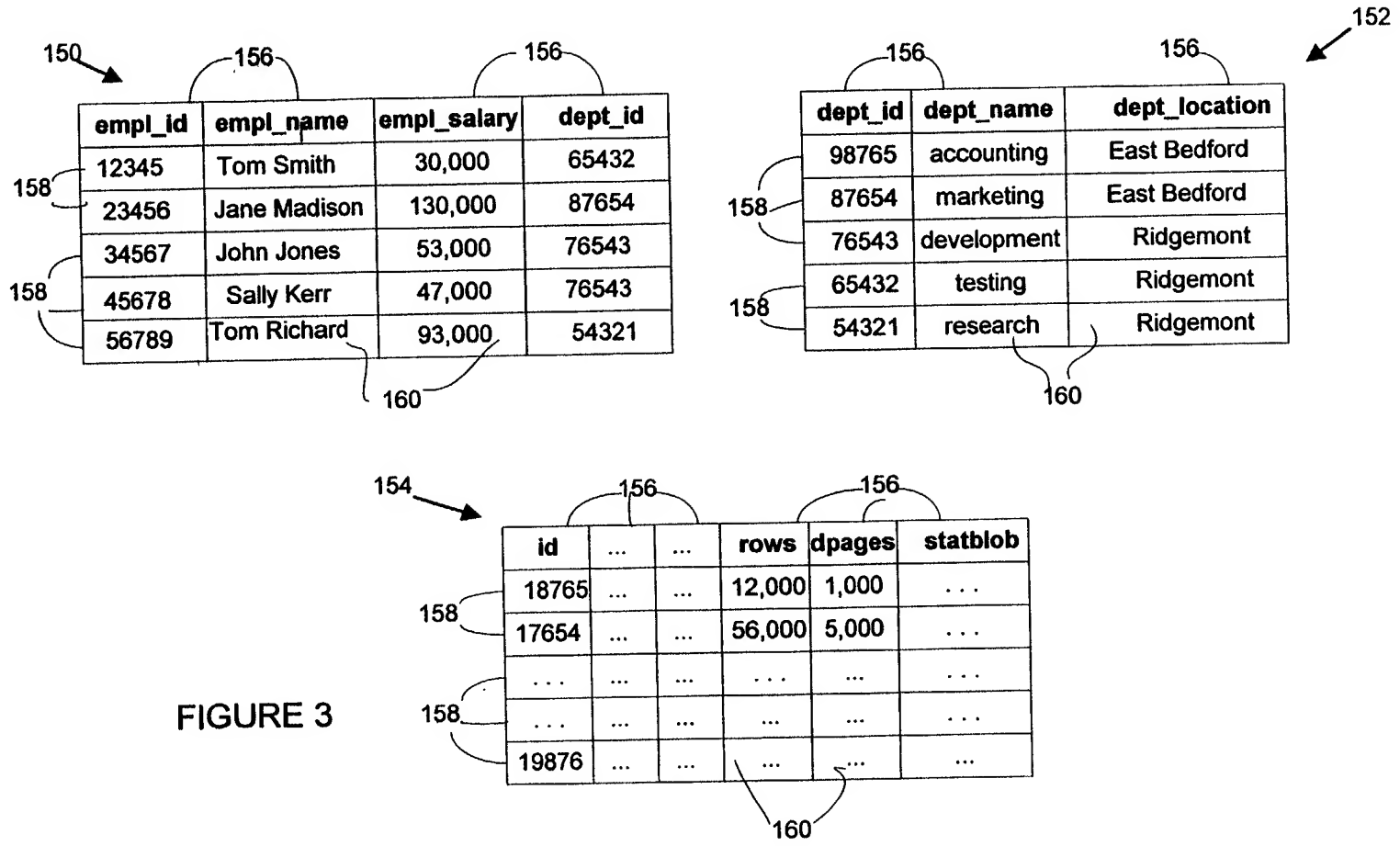

FIGURE 3

Docket No.: MSFT-1079/115148.2
Title: AUTOMATIC DATABASE STATISTICS CREATION
Inventor(s): Nigel R. Ellis and Rodger N. Kline
Sheet 3 of 11
Atty: John E. McGlynn, Esq.
Tel.: 215-564-8382

Docket No.: MSFT-1079/115148.2
Title: AUTOMATIC DATABASE STATISTICS CREATION
Inventor(s): Nigel R. Ellis and Rodger N. Kline
Sheet 4 of 11
Atty: John E. McGlynn, Esq.
Tel.: 215-564-8382

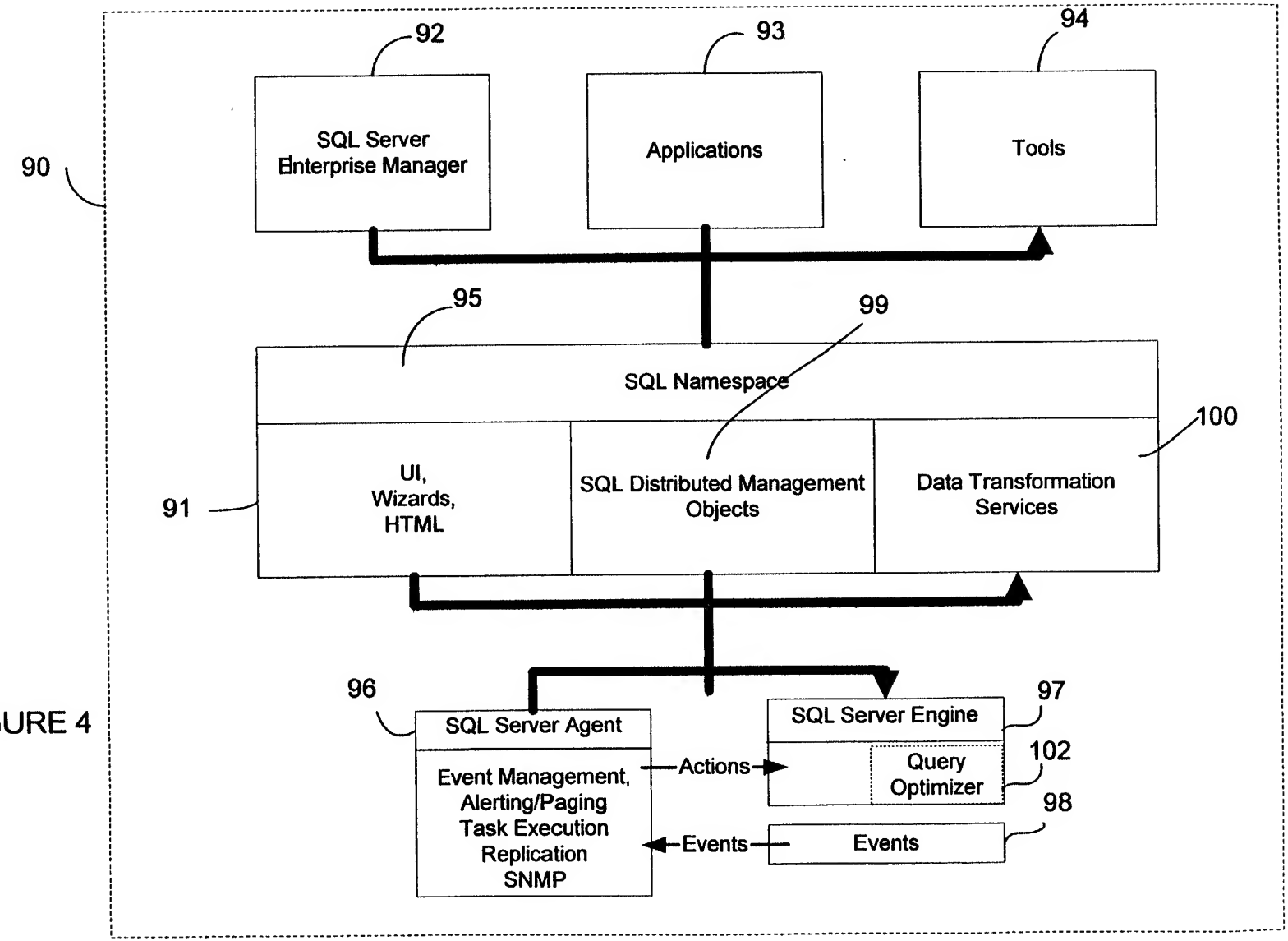

FIGURE 4

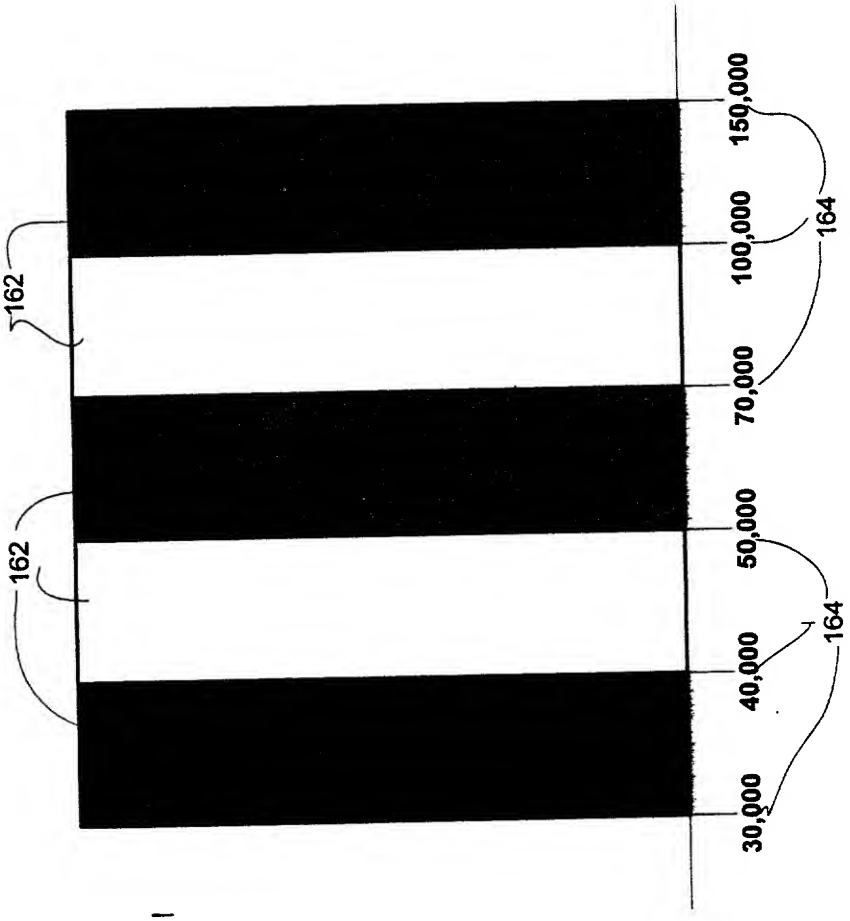

FIGURE 5

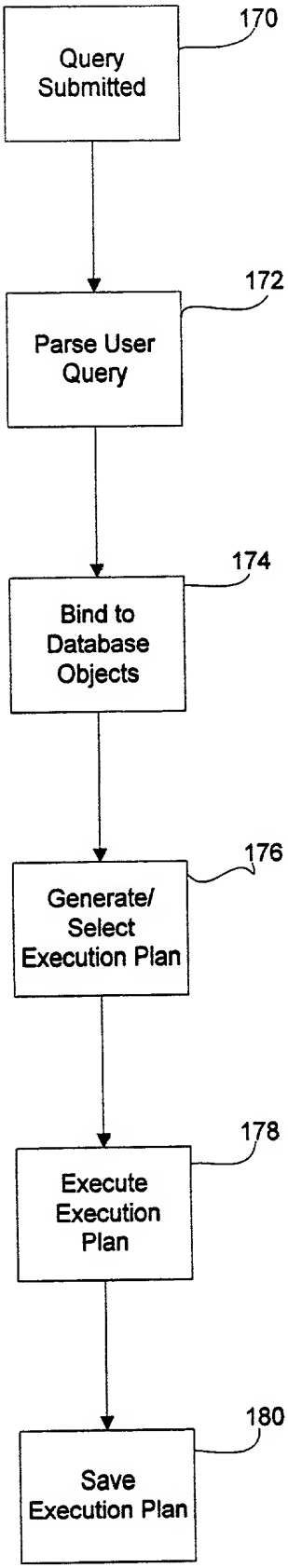
Query Submitted
170
Parse User Query
172
Bind to Database Objects
174
Generate/ Select Execution Plan
176
Execute Execution Plan
178
Save Execution Plan
180

FIGURE 6

Docket No.: MSFT-1079/115148.2
Title: AUTOMATIC DATABASE STATISTICS CREATION
Inventor(s): Nigel R. Ellis and Rodger N. Kline
Sheet 7 of 11
Atty: John E. McGlynn, Esq.
Tel.: 215-564-8382

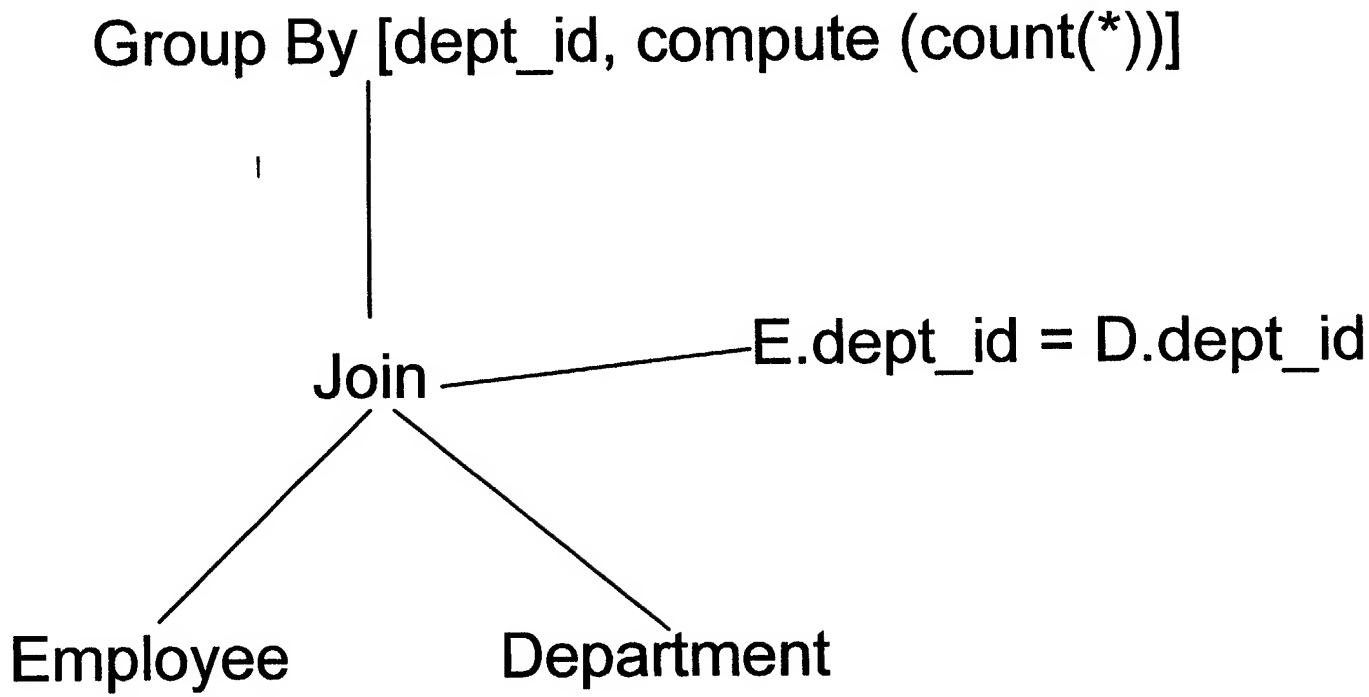

FIGURE 7

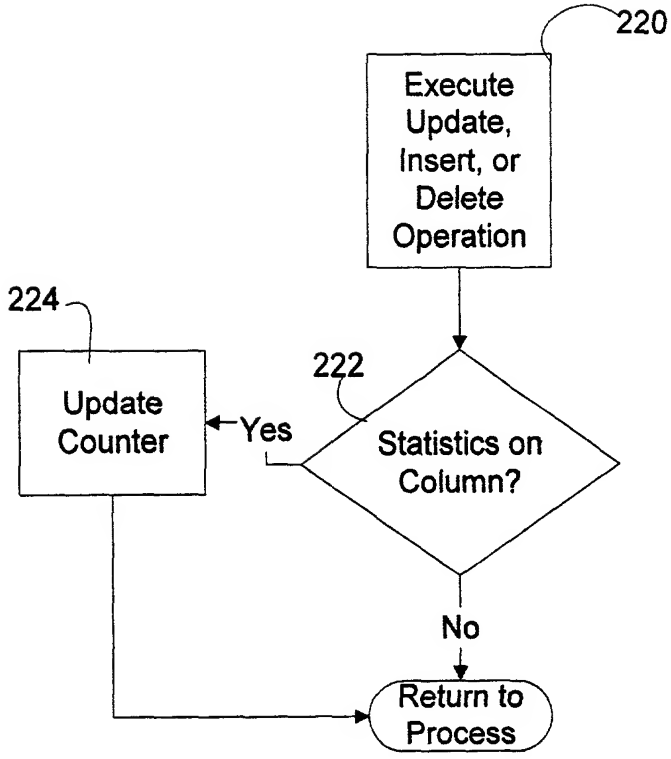
220
Execute Update, Insert, or Delete Operation
224
Update Counter
Yes
222
Statistics on Column?
No
Return to Process

FIGURE 8

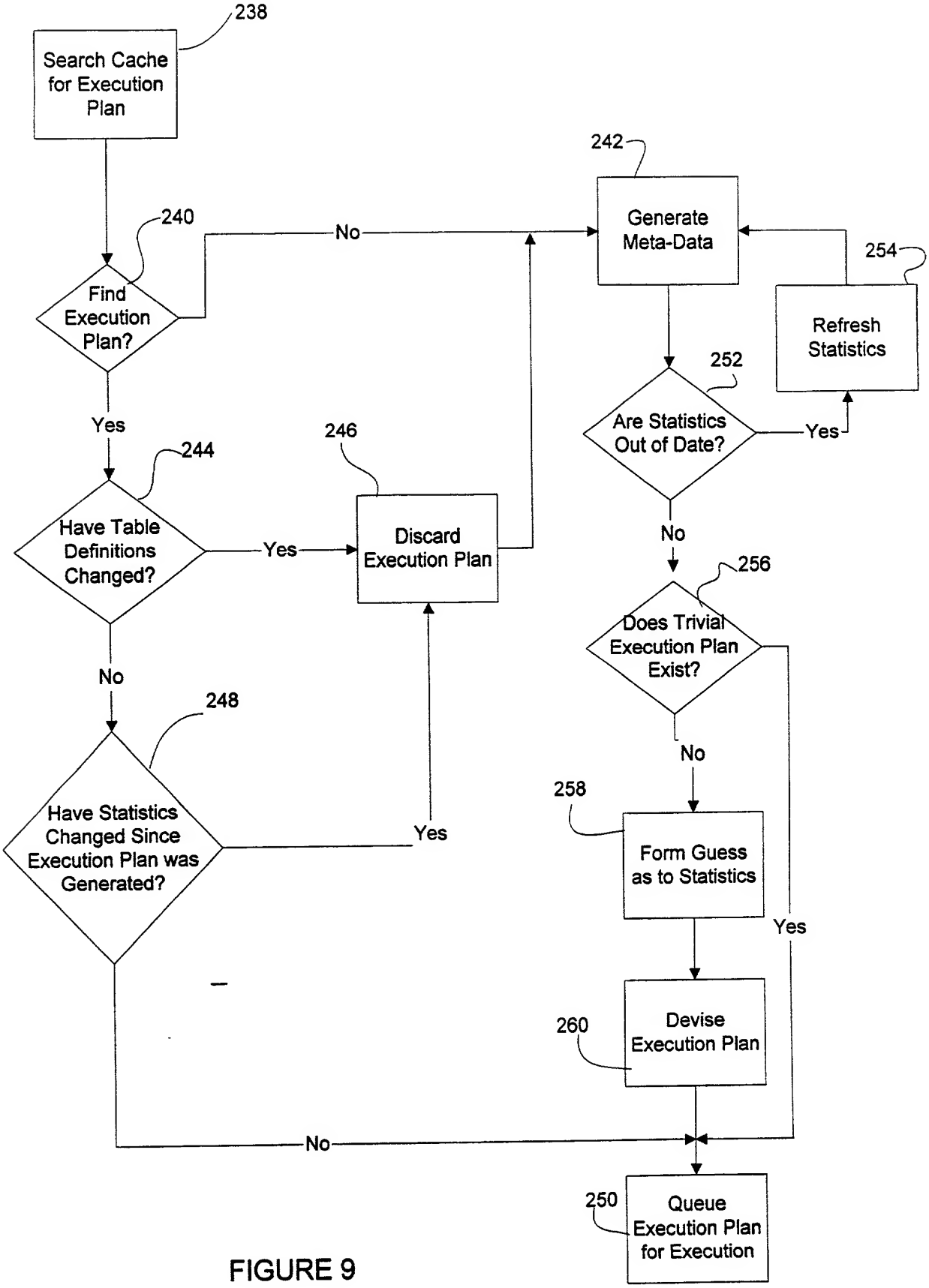
238
Search Cache for Execution Plan
240
Find Execution Plan?
No
242
Generate Meta-Data
254
Refresh Statistics
252
Are Statistics Out of Date?
Yes
Yes
244
Have Table Definitions Changed?
Yes
246
Discard Execution Plan
No
256
Does Trivial Execution Plan Exist?
No
248
Have Statistics Changed Since Execution Plan was Generated?
Yes
No
258
Form Guess as to Statistics
Yes
260
Devise Execution Plan
No
250
Queue Execution Plan for Execution

FIGURE 9

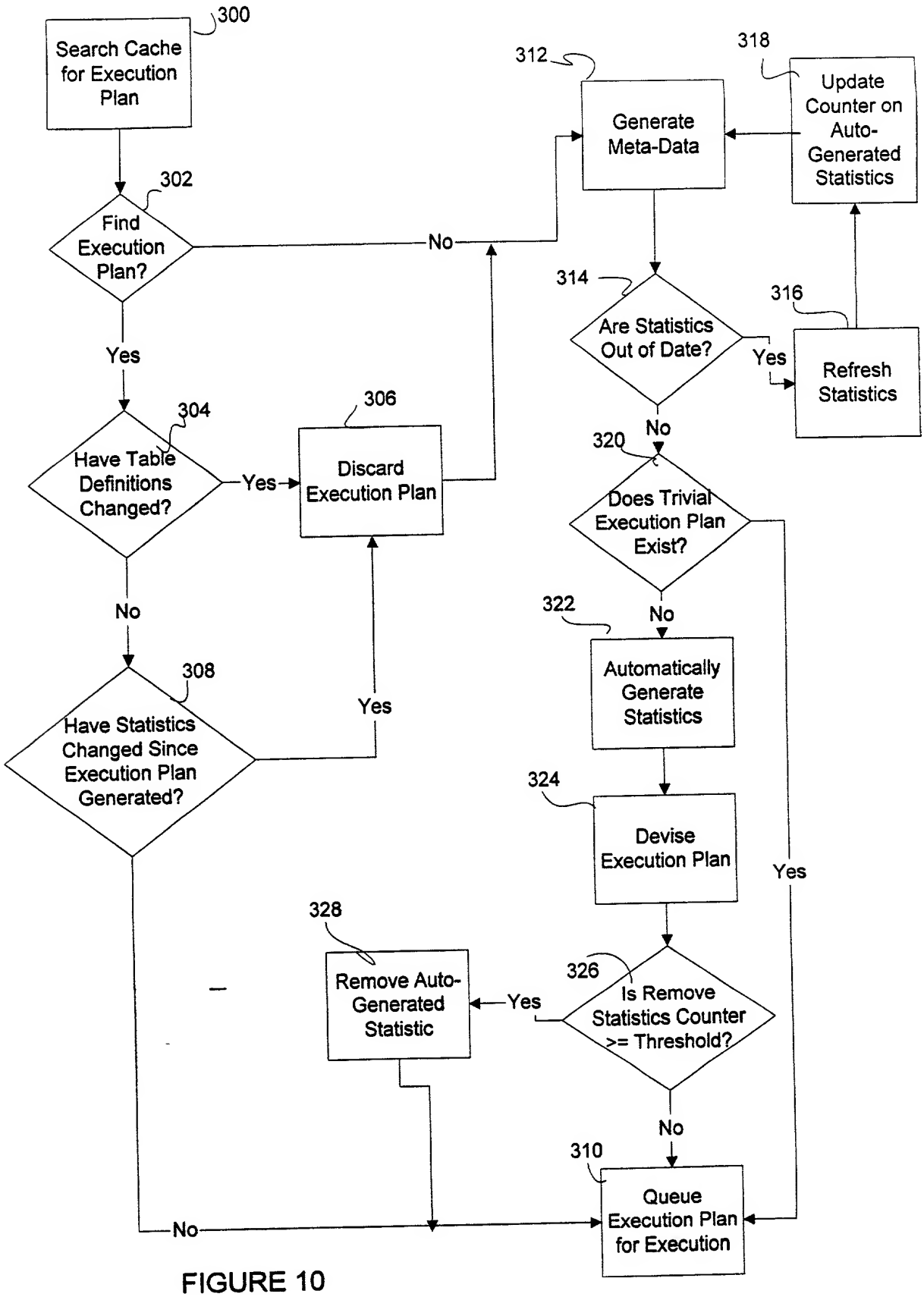
300
Search Cache for Execution Plan
302
Find Execution Plan?
No
Yes
304
Have Table Definitions Changed?
Yes
306
Discard Execution Plan
No
308
Have Statistics Changed Since Execution Plan Generated?
Yes
No
312
Generate Meta-Data
318
Update Counter on Auto-Generated Statistics
314
Are Statistics Out of Date?
Yes
316
Refresh Statistics
No
320
Does Trivial Execution Plan Exist?
Yes
No
322
Automatically Generate Statistics
324
Devise Execution Plan
326
Is Remove Statistics Counter >= Threshold?
Yes
328
Remove Auto-Generated Statistic
No
310
Queue Execution Plan for Execution

FIGURE 10

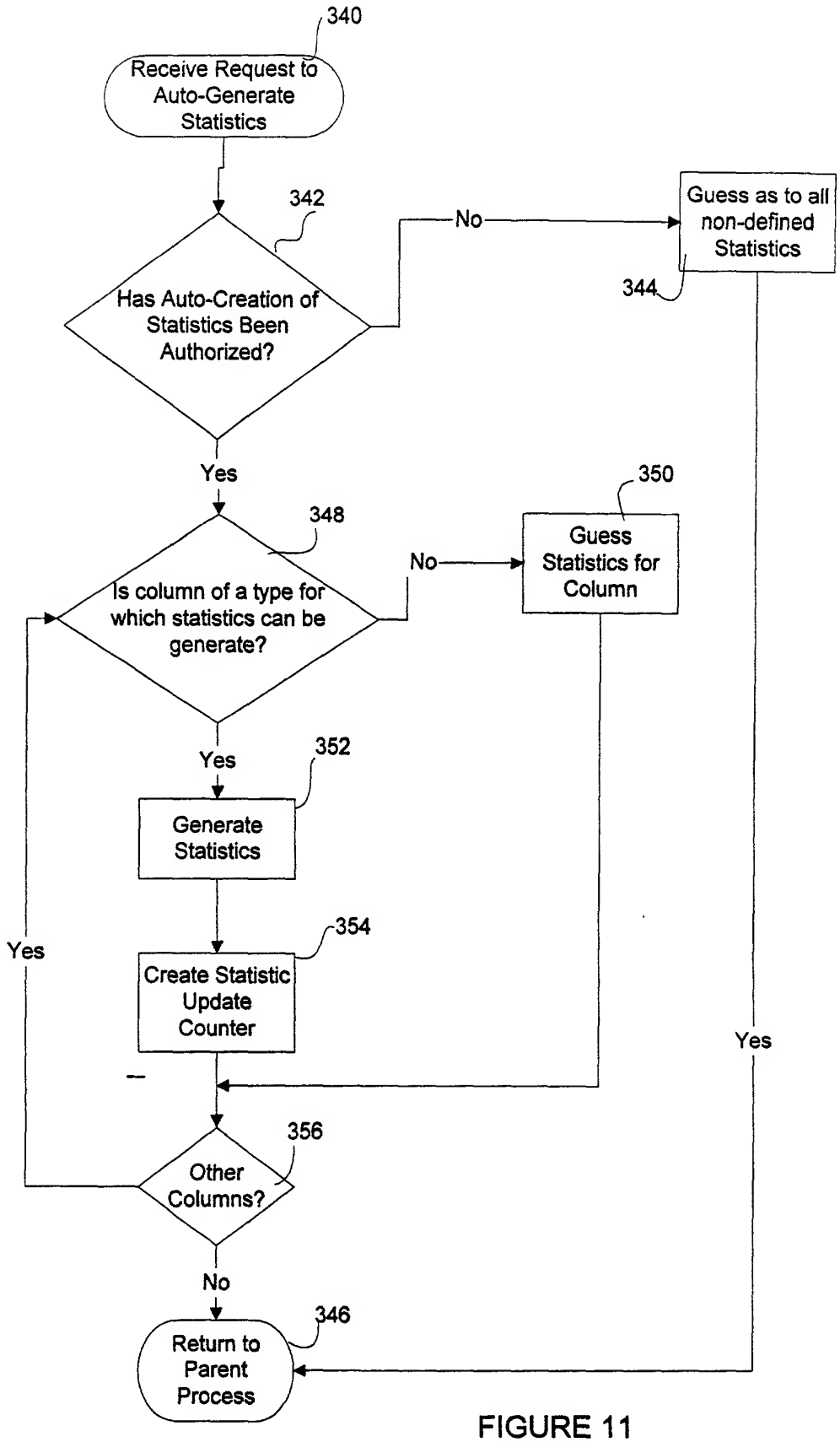
340
Receive Request to Auto-Generate Statistics
342
Has Auto-Creation of Statistics Been Authorized?
No
Guess as to all non-defined Statistics
344
Yes
348
Is column of a type for which statistics can be generate?
No
350
Guess Statistics for Column
Yes
352
Generate Statistics
354
Create Statistic Update Counter
Yes
356
Other Columns?
Yes
No
346
Return to Parent Process

FIGURE 11